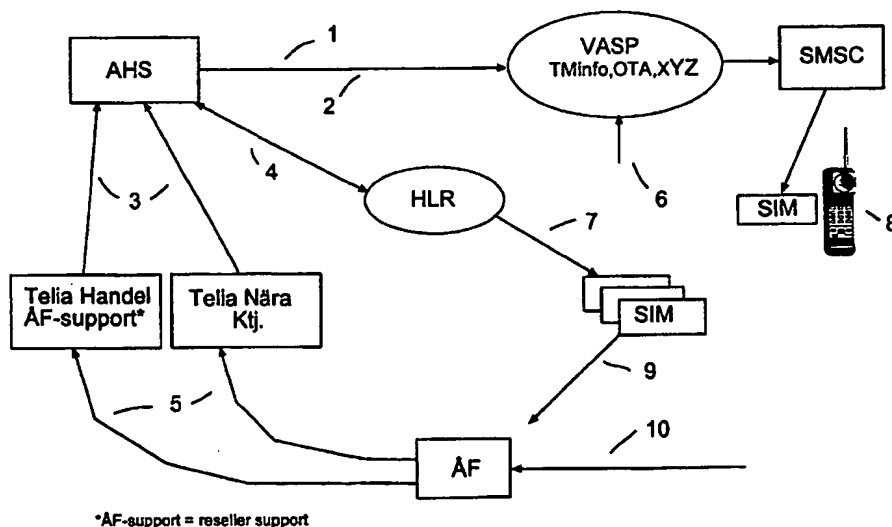




INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁶ : H04Q 7/32		A1	(11) International Publication Number: WO 98/57511
			(43) International Publication Date: 17 December 1998 (17.12.98)
(21) International Application Number: PCT/SE98/01086 (22) International Filing Date: 8 June 1998 (08.06.98) (30) Priority Data: 9702265-1 13 June 1997 (13.06.97) SE (71) Applicant: TELIA AB [SE/SE]; Mårbackagatan 11, S-123 86 Farsta (SE). (72) Inventors: SANDGREN, Jörgen; Karlbergsvägen 87A, S-113 35 Stockholm (SE). HELLSTRÖM, Jonas; Centralgatan 79, S-149 40 Nynäshamn (SE). (74) Agent: PRAGSTEN, Rolf; Telia Research AB, Vitsandsgatan 9, S-123 86 Farsta (SE).		(81) Designated States: EE, LT, LV, NO, European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE). Published <i>With international search report. Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i>	

(54) Title: SIM-FUNCTION



(57) Abstract

The invention relates to a method at a wireless telecommunications system which makes possible an automatic activation respective deactivation of a SIM locking function in a GSM network. Before a telecommunication terminal has been distributed to a user, a telephone and a SIM-card are adapted to each other. The in the connection included SIM locking function results in that the user cannot utilize other SIM-cards than those which are in the package when the telephone is delivered to the customer. The invention is characterized by a method which implies that the SIM locking function can be unlocked by means of utilizing SIM toolkit functions and a carrier service, such as SMS or USSD. The unlocking of the SIM locking function is controlled by different criteria such as when the customer has transmitted his/her undersigned agreement to the network operator.

FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AL	Albania	ES	Spain	LS	Lesotho	SI	Slovenia
AM	Armenia	FI	Finland	LT	Lithuania	SK	Slovakia
AT	Austria	FR	France	LU	Luxembourg	SN	Senegal
AU	Australia	GA	Gabon	LV	Latvia	SZ	Swaziland
AZ	Azerbaijan	GB	United Kingdom	MC	Monaco	TD	Chad
BA	Bosnia and Herzegovina	GE	Georgia	MD	Republic of Moldova	TG	Togo
BB	Barbados	GH	Ghana	MG	Madagascar	TJ	Tajikistan
BE	Belgium	GN	Guinea	MK	The former Yugoslav Republic of Macedonia	TM	Turkmenistan
BF	Burkina Faso	GR	Greece	ML	Mali	TR	Turkey
BG	Bulgaria	HU	Hungary	MN	Mongolia	TT	Trinidad and Tobago
BJ	Benin	IE	Ireland	MR	Mauritania	UA	Ukraine
BR	Brazil	IL	Israel	MW	Malawi	UG	Uganda
BY	Belarus	IS	Iceland	MX	Mexico	US	United States of America
CA	Canada	IT	Italy	NE	Niger	UZ	Uzbekistan
CF	Central African Republic	JP	Japan	NL	Netherlands	VN	Viet Nam
CG	Congo	KE	Kenya	NO	Norway	YU	Yugoslavia
CH	Switzerland	KG	Kyrgyzstan	NZ	New Zealand	ZW	Zimbabwe
CI	Côte d'Ivoire	KP	Democratic People's Republic of Korea	PL	Poland		
CM	Cameroon	KR	Republic of Korea	PT	Portugal		
CN	China	KZ	Kazakhstan	RO	Romania		
CU	Cuba	LC	Saint Lucia	RU	Russian Federation		
CZ	Czech Republic	LI	Liechtenstein	SD	Sudan		
DE	Germany	LK	Sri Lanka	SE	Sweden		
DK	Denmark	LR	Liberia	SG	Singapore		
EE	Estonia						

TITLE OF THE INVENTION: SIM-FUNCTION

Field of the invention

5 The present invention relates to a method at a wireless communications network for activation respective deactivation of a locking function in a mobile terminal in said network.

Prior art

10 Before a SIM-card based mobile telephone is distributed for sale, the mobile telephone is adapted to a specific SIM-card. This can be done at the manufacturing place of the telephone, or at a supplier's, best done at the packing of the mobile telephone and the SIM-card.

15 The mobile telephone is equipped with a SIM locking function, which implies that when the customer obtains his/her mobile telephone and his/her SIM-card, the customer can only use the SIM-card/cards which are in the packing. Other SIM-cards consequently cannot be used in the mobile
20 telephone. The unlocking of the SIM locking function is done in such a way that the operator distributes keys for unlocking the mobile telephone. When the SIM locking function is unlocked by means of the key, other SIM-cards can be used in the mobile telephone.

25 One problem with the above mentioned is that it is cumbersome and expensive to distribute keys to every new customer. Another problem is that it is experienced as cumbersome by the customer to have to wait for his/her keys to be able to utilize the mobile telephone to its full
30 extent.

The aim of the present invention consequently is to solve this problem.

Summary of the invention

35 The above mentioned aim is achieved by a method at a wireless telecommunications network for activation

respective deactivation of a locking function in a mobile terminal in the network, at which the activation respective deactivation of the locking function in the mobile terminal is executed by an operator, at any predecided occasion, transferring commands, via a carrier service in the network, to the mobile terminal, which commands activate or deactivate the locking function in the mobile terminal.

By that, the need of keys which shall be distributed to the customer is eliminated. In addition the customer does not need to unlock the terminal himself/herself, because this is attended to by the operator via a carrier service such as SMS or USSD.

Further advantages are that the invention gives possibility to in a supple way handle present subscriptions; protects against reselling and export of pre-sent subscriptions with belonging telephone; makes more difficult and reduces the interest of the resellers to sell many subscriptions from different operators to one customer; the telephone will be less attractive to steal in the distribution stage; improves the handling of number and SIM-cards with less wastage as a result.

Further characteristics of the present invention are given in the subclaims.

Brief description of the drawing

In the following a detailed description of an embodiment of the present invention is given with reference to the only drawing.

Figure 1 describes schematically the procedure of unlocking the SIM locking function.

1. At registration, activate OTA, SIM-lock, update MSISDN.
2. (The customer X, does agreement exist, open SIM-lock, this is the customer's phone number).
3. Subscr. registered.

4. Subscr. updated automatically.
5. Subscr. is sent via THOL, fax, letter.
6. Function implementation VASP (Value Added Services Platform).
- 5 7. Active SIMs.
8. ME must support: SIM-lock, SIM toolkit.
9. ÅF has active SIMs in shop.
10. Customer wants to buy Reg.Mob.

10 Detailed description of an embodiment of the invention

Distribution security is a new function which combines SIM-lock and SIM-toolkit in a unique way. The function gives operators possibility to protect provision to a greater extent than what is possible today.

- 15 Before a telephone is distributed, a telephone and a SIM-card is, as has been mentioned above, matched together. This can be done at the factory, or with a supplier. This is best done at packing of the telephone and the SIM-card. The SIM locking function results in that the customer
- 20 cannot use other SIM-cards than those that were enclosed in the package.

- In order to unlock SIM-lock, SIM toolkit functions are used and a carrier service, for instance SMS or USSD. The unlocking can be controlled by different criteria, for
- 25 instance when the customer has sent in his/her signed agreement. The operator consequently need not distribute any keys to unlock the terminals and minimizes the risks of bad reputation by using SIM-lock.

- In the following a conceivable scenario of how the unlocking of the SIM locking function can be achieved is
- 30 given.

- When a customer registers a subscription at a reseller's (ÅF), this registration is sent via THOL, fax, letter to "Telia Handel" reseller support (ÅF support)
- 35 alternatively "Telia Nära" customer service (Ktj.), which

in its turn registers the subscription in a support system unit (GSM-AHS).

AHS checks whether the customer has signed a valid subscription agreement between customer and Telia AB. If no
5 subscription agreement has been made, nothing happens. As soon as an agreement has been made (i.e. the customer has undersigned and sent in the subscription agreement) and been registered in AHS, functions are activated in the network and information is transmitted to the customer's
10 mobile telephone which is unlocked, at which other SIM-cards can be used together with the mobile telephone. AHS consequently instructs VASP (Value Added Services Platform) about that the SIM locking function shall be unlocked, at which VASP instructs an SMS-controller (SMSC) to transmit a
15 special message (SMS-special) and SIM-unlocking commands SIM delock MSISDN (Mobile System -ISDN). The mobile telephone which supports SIM lock and SIM toolkit receives SIM unlocking commands, after which the SIM toolkit function unlocks (activates) the mobile telephone so it can
20 be used by other SIM-cards. At the same time the mobile telephone receives a message on its display that the subscription is confirmed, and that the customer is welcome as customer at Telia AB. The customer does not see what has actually happened, but only receives a confirmation that
25 the subscription is registered and a welcome-message.

It should of course be realized that an operator any time can lock (deactivate) the mobile telephone so that it cannot be used by other SIM-cards by transmitting commands which attends to that SIM toolkit locks the mobile
30 telephone.

The above mentioned is only to be regarded as a preferred embodiment and the extent of protection of the invention is only defined by what appears from the following patent claims.

PATENT CLAIMS

1. Method at a wireless communications network for activation, respective deactivation, of a locking function
5 in a mobile terminal belonging to just any customer in said network, c h a r a c t e r i z e d in that the activation, respective deactivation, of the locking function in said mobile terminal is executed by an operator, at just any predetermined occasion, transferring commands via a carrier
10 service in said network to said mobile terminal, which commands activate respective deactivate the locking function in said mobile terminal.

2. Method according to patent claim 1,
c h a r a c t e r i z e d in that said locking function is
15 a SIM locking function.

3. Method according to any of the patent claims 1 or 2, c h a r a c t e r i z e d in that said carrier service is SMS or USSD.

4. Method according to any of the patent claims 2 or
20 3, c h a r a c t e r i z e d in that said mobile terminal supports the SIM locking function and the SIM toolkit function, at which said commands attends to that the SIM toolkit function unlocks (activates) said mobile terminal.

5. Method according to patent claim 4,
25 c h a r a c t e r i z e d in that the unlocking of the SIM locking function is controlled by different just any criteria.

6. Method according to patent claim 5,
c h a r a c t e r i z e d in that said operator attends to
30 unlocking of the SIM locking function when he/she receives undersigned agreement from said customer.

7. Method according to any of the previous patent claims, c h a r a c t e r i z e d in that said network is a GSM network.

1/1

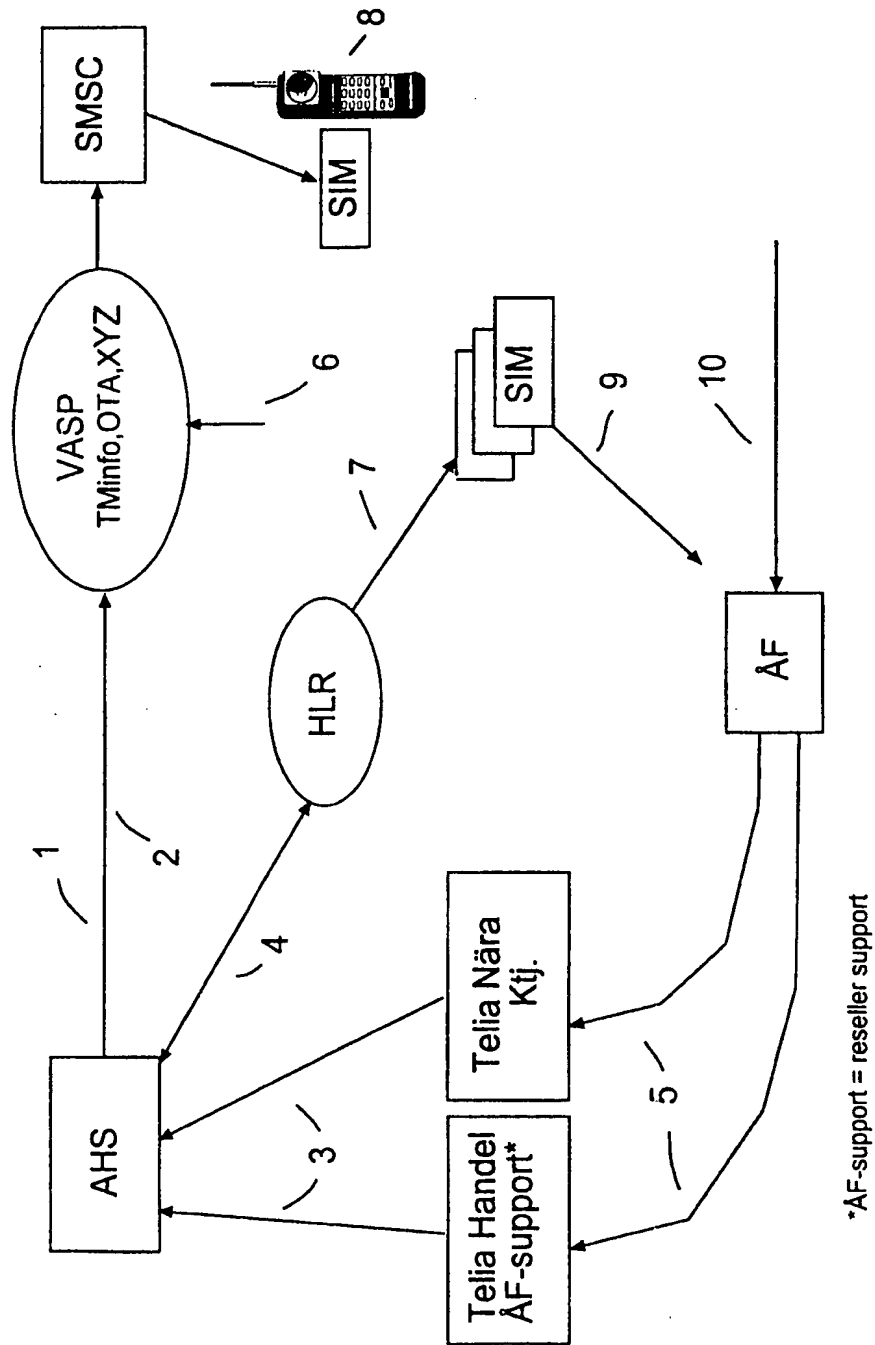


Figure 1

INTERNATIONAL SEARCH REPORT

International application No.

PCT/SE 98/01086

A. CLASSIFICATION OF SUBJECT MATTER

IPC6: H04Q 7/32

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC6: H04Q

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

WPI, EDOC, INSPEC

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0757502 A2 (NOKIA MOBILE PHONES LTD.), 5 February 1997 (05.02.97), column 2, line 9 - column 3, line 13; column 12, line 6 - line 21	1-2,4-7
Y	--	3
X	WO 9523487 A1 (GTE MOBILE COMMUNICATIONS SERVICE CORPORATION), 31 August 1995 (31.08.95), page 1, line 33 - page 2, line 3; page 2, line 29 - line 33; page 5, line 10 - line 13, page 6, line 23 - line 32, page 8, line 1 - line 8, page 15, line 37 - page 16, line 6	1-2,4-7
Y	--	3

☒ Further documents are listed in the continuation of Box C.☒ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

6 November 1998

Date of mailing of the international search report

11 - 11 - 1998

Name and mailing address of the ISA/
Swedish Patent Office
Box 5055, S-102 42 STOCKHOLM
Facsimile No. +46 8 666 02 86

Authorized officer

Peter Hedman

Telephone No. +46 8 782 25 00

INTERNATIONAL SEARCH REPORT

International application No.

PCT/SE 98/01086

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5603084 A (RAYMOND C. HENRY, JR. ET AL), 11 February 1997 (11.02.97), column 2, line 15 - line 37, abstract	1
Y		3
A	--	2,4-7
X	EP 0478231 A2 (AMERICAN TELEPHONE AND TELEGRAPH COMPANY), 1 April 1992 (01.04.92), page 3, line 17 - line 24; page 3, line 40 - line 48	1
A	--	2-7
X,P	WO 9722221 A2 (BELLSOUTH CORPORATION), 19 June 1997 (19.06.97), page 5, line 2 - line 22; page 6, line 20 - line 29; page 12, line 19 - line 26, abstract	1-7
A	GB 2287855 A (VODAFONE LIMITED), 27 Sept 1995 (27.09.95), page 5, line 18 - page 6, line 7	1-7
A,P	EP 0796023 A2 (NOKIA MOBILE PHONES LTD.), 17 Sept 1997 (17.09.97), column 4, line 35 - line 37, abstract	1-7
	-- -----	

INTERNATIONAL SEARCH REPORT

Information on patent family members

05/10/98

International application No.

PCT/SE 98/01086

Patent document cited in search report			Publication date	Patent family member(s)			Publication date
EP	0757502	A2	05/02/97	JP	9121387	A	06/05/97
				US	5600708	A	04/02/97
				US	5809413	A	15/09/98

WO	9523487	A1	31/08/95	AU	686742	B	12/02/98
				AU	687996	B	05/03/98
				AU	689215	B	26/03/98
				AU	1695995	A	11/09/95
				AU	1698995	A	11/09/95
				AU	1737995	A	11/09/95
				AU	7319598	A	27/08/98
				BR	9506893	A	09/09/97
				BR	9506894	A	09/09/97
				BR	9506895	A	09/09/97
				CN	1141709	A	29/01/97
				CN	1142306	A	05/02/97
				CN	1151237	A	04/06/97
				EP	0746953	A	11/12/96
				EP	0746954	A	11/12/96
				EP	0746955	A	11/12/96
				JP	9509542	T	22/09/97
				JP	9509543	T	22/09/97
				JP	9509544	T	22/09/97
				US	5535260	A	09/07/96
				US	5594782	A	14/01/97
				US	5787354	A	28/07/98
				WO	9523486	A	31/08/95
				WO	9523488	A	31/08/95
				US	5794141	A	11/08/98

US	5603084	A	11/02/97	AU	5300896	A	18/09/96
				CA	2213464	A	06/09/96
				CN	1182522	A	20/05/98
				WO	9627270	A	06/09/96

EP	0478231	A2	01/04/92	SE	0478231	T3	
				CA	2045800	A,C	29/03/92
				DE	69124445	D,T	26/06/97
				ES	2096631	T	16/03/97
				JP	6284078	A	07/10/94
				US	5297191	A	22/03/94
				US	5722084	A	24/02/98
				CA	2045801	A,C	29/03/92
				JP	2593599	B	26/03/97
				JP	6343108	A	13/12/94
				US	5297192	A	22/03/94

WO	9722221	A2	19/06/97	AU	1409997	A	03/07/97
				EP	0867099	A	30/09/98

GB	2287855	A	27/09/95	GB	9505549	D	00/00/00
				AU	1902495	A	09/10/95
				GB	9405615	D	00/00/00
				GB	9411143	D	00/00/00
				WO	9526115	A	28/09/95

INTERNATIONAL SEARCH REPORT

Information on patent family members

05/10/98

International application No.

PCT/SE 98/01086

Patent document cited in search report			Publication date	Patent family member(s)		Publication date
EP	0796023	A2	17/09/97	FI	961154 A	14/09/97
